8

A NEW TREATISE ON THE DISEASES OF THE Chryſtalline Humour OF A HUMAN EYE:

Or, of the Cataract *and* Glaucoma.

WITH A

New Theory of their CAUSES, and an Endeavour to demonſtrate that there are no membranous Cataracts; but that all Cataracts are from an Alteration of the chryſtalline Humour itſelf.

WITH

An exact Deſcription of a new and more ſucceſsful Method of making the Operations neceſſary to the Removal of the ſeveral Species of theſe Diſeaſes.

Humbly addreſs'd to Her MAJESTY.

To which is prefix'd,

A LETTER to the PHYSICIANS and SURGEONS of *London* and *Weſtminſter*.

Qui dat videre, dat vivere. Cic.

By JOHN TAYLOR, M. D. Oculiſt,
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TO THE QUEEN.

MADAM,

THE great Advantage of a perfect Enjoyment of Sight, and the deplorable Condition of the Blind, are ſo obvious, that I need not make an Apology for writing a Treatiſe on this Subject, ſince nothing of the Kind has yet appear'd in our Language worthy the leaſt Notice. And I am ſo much the more encourag'd to publiſh it, that I have the Honour to lay it at your MAJESTY's Feet, who are as capable of judging of its Solidity and Merit, as You are inclin'd to encourage ARTS and SCIENCES; and whoſe great Diſcernment in all Things is equal to thoſe eminent Virtues which have made You the Glory of Your Sex, have added Luſtre to Majeſty, and inwardly adorn'd the Splendor of an outward Crown.

The Honour, MADAM, which I have had to attend Your MAJESTY, and the gracious Attention You were pleas'd to favour me with in what I was allow'd to lay before You, permits me to hope that this WORK will have the good Fortune of proving acceptable to Your MAJESTY.

It would, MADAM, be the greateſt Preſumption in me to undertake to celebrate Your MAJESTY's Praiſes, conſcious as I am that I could never riſe up to the Grandeur of the Subject; and therefore it better becomes me to admire with a reſpectful Silence thoſe amiable Qualities that have gain'd Your MAJESTY the Eſteem and Affection of Your People at Home, and made You the Envy and Wonder of the politeſt Nations abroad.

I am,

MADAM,

With the greateſt

Reſpect and Submiſſion,

Your MAJESTY'*s*

moſt humble and moſt dutiful

Subject and Servant,

JOHN TAYLOR.

TO THE
PHYSICIANS
AND
SURGEONS
OF
London and *Weſtminſter.*

GENTLEMEN,

OF all the Senſes, that of Seeing is allow'd to be moſt uſeful; yet 'tis a general receiv'd Opinion, that the Organ deſtin'd to ſerve to that noble End, is more expoſed to Dangers, more liable to Infirmities and Diſeaſes than any other; and that ſuch Diſeaſes are with more Difficulty *removed. This, indeed, ſeems to reflect upon the Conduct of Nature, who has always beſt guarded thoſe Parts, which are of greateſt Uſe: But I believe the Objection may be ſoon anſwer'd, and Nature be found here in no wiſe to differ from her ordinary Method of acting; if we conſider what little Attention has been given to this Branch of Knowledge, and how few have engaged in its Practice.*

There is no Doubt but the Cauſe of this Ignorance ariſes from the great Nicety that attends its Study, and the little Succeſs that has flow'd from its Practice; if, therefore, from the following Sheets, it may appear I have apply'd myſelf with more Diligence to the former; or if the Succeſs which I have met with in the latter may be every Day known, I queſtion not, but theſe will be ſufficient Motives to recommend this Piece to your Peruſal; and of this I am the more perſuaded, becauſe I apprehend, you, who are particularly diſtinguiſh'd in the learned World from your Superior Judgment in Phyſick, can't but be well pleas'd with any Induſtry, that may be conducive to the improving this moſt uſeful, and perhaps only Part, which has been hitherto leaſt known.

Whatever may have been thought of the Method I have taken towards the Advancement of this Science, may be needleſs *to mention; but I muſt beg Leave to obſerve thus much in my Favour, that the late tedious Progreſs I have taken, which I find has given to ſome a Cauſe of Objection, has been the only Means and Foundation of my Knowledge and Improvement, as it has furniſh'd me with an Opportunity of making my Remarks upon a greater Number of Subjects, in a few Years, than the whole Series of my Life, in a ſettled Way, could poſſibly have afforded me.*

I wou'd be here underſtood, that from the many Experiments I have made during the uninterrupted Courſe of Eight Years (the Time I was on this Progreſs) I have been furniſh'd with thoſe Lights which have enabled me to form a more certain and extenſive Theory than my Predeceſſors could pretend to, or my Contemporaries can boaſt of. And ſurely it muſt be granted, that in all Sciences, that which is ſupported by a Number of inconteſtible Facts, is preferable to that which is only founded upon a precarious, and often chimerical Hypotheſis: Therefore, Gentlemen, I hope, what I have the Honour to preſent you, will be read and examin'd, without the leaſt Regard to any private Ends, but purely in the View of rendring Service to the Publick.

Not to mention that Variety of Diſeaſes, for the Cure of which we have hitherto had no true Method propoſed, and which I have endeavour'd to remedy, by a more eaſy and ſecure Way than has yet been found out; that of the Cataract, as being more general, is, for that Reaſon, more worthy of Remark; eſpecially if we conſider that it has been thought neceſſary to expoſe the Patient to wait ſometimes many Years in a very miſerable State, for the Maturity of it; in hopes of Succeſs from an Operation which has always been acknowledg'd dangerous, and ſo very uncertain, by the ordinary Methods, that 'tis even hard to conceive why it ſhould not rather totally deſtroy the Sight, than prove a Means of its Recovery.

If it ſhall appear from the Succeſs ſome of you have ſeen, and the Account here given of the Manner of my removing theſe Diſorders, that I am the firſt who have diſcover'd the Means to avoid that painful Delay of a Cataract's Maturity, and to remove the ſeveral Species of it with leſs Danger, I hope you will think me worthy your Eſteem, as well as that of the Publick.

The Gutta Serena *has been hitherto generally judged Incurable; but if it is evident from my Practice, and in the Progreſs of this Work, that I have been ſo happy as to find out a Way of removing ſeveral Species of it, I hope, ſince I explain the Methods, and pretend to no Secret, there will be nothing in this Caſe that ſavours of Preſumption.*

It may not, perhaps, be amiſs to obſerve here, that it has ever been a Cuſtom with the profeſs'd Oculiſts of all Nations, to make a Secret of their Practice, and to refuſe to communicate to any one a Share of that Knowledge they poſſeſs'd. For my Part, I declare publickly my Deſign of acting in a different Manner, and am ſo far from deſiring to conceal my Practice, that I ſhall ever uſe my utmoſt Endeavours to make it more diffuſive and univerſal.

I am far from affirming, that I have a compleat Knowledge of all the Diſeaſes of the Eye; and own there are many Things I am unacquainted with: But it may be ſufficient here to recommend my Practice and Theory to the Judgment of You, who, from your Education, can be no Strangers to the Subject; and I ſhall beg Leave to finiſh with this Reflection, That whatever Fate attends this Work, I know

I know no Enemies amongſt you, except thoſe who ſacrifice more to Mammon than Reaſon.

I am,

GENTLEMEN,

Your Obedient,

Humble Servant,

Suffolk-Street, Dec. 21.
1735.

JOHN TAYLOR.

ON THE DISEASES OF THE Chryſtalline HUMOUR.

* * *

CHAP. I.

Of the CATARACT *in general.*

WHAT the *Greeks* call *Hypochyma*, and the *Latins*, *Suffuſio*, is one and the ſame Diſeaſe, known by the Name of *Cataract*.

Authors are not agreed about the Nature of a Cataract; ſome pretend that it is a Subſtance of a membranous Appearance, formed from a diſeas'd Alteration of the aqueous Humour; others, that it is a Subſtance of a membranous Appearance form'd from *Pus*, ſeparated by a Loſs of Continuity of the Veſſels of the *Uvea*; and others on the contrary aſſert, that there are no membranous Cataracts, but that all Cataracts are an Alteration of the chryſtalline Humour itſelf.

They who believe that a Cataract is a Subſtance of a membranous Appearance from a diſeas'd Alteration of the aqueous Humour, tell us, That when any impure Particles are emitted into the aqueous Humour of an improper Quality, Figure, or Magnitude, to paſs on in the uſual Circulation; they continue moving about this Humour, till by their Levity or Viſcidity they aſſemble together behind the Pupil, and by degrees obtain the Conſiſtence and Opacity of a Pellicle or Membrane.

If we conſider the Situation and different Quantity of the aqueous Humour in the two Chambers of the Eye, with the manner of its Supplies, we ſhall be encourag'd to believe that ſuch a Subſtance of a membranous Appearance would rather form itſelf in the anterior than in the poſterior Chamber; and ſince we have no Inſtance of a Cataract being form'd in the anterior Chamber, we may very reaſonably conclude that no Cataract can be form'd from any diſeas'd Alteration of the aqueous Humour.

They who believe that a Cataract is a Subſtance of a membranous Appearance form'd from *Pus*, ſeparated by a Loſs of Continuity of the Veſſels of the *Uvea*, tell us, That the obſtructed Veſſels of the *Uvea* in an Inflammation, emit a whitiſh *Pus* into the poſterior Chamber of the aqueous, which by its Viſcidity adheres to the Circumference of the Pupil, and forms a membranous Cataract.

Experience daily proves the Error of this Hypotheſis; for if we obſerve the different Poſitions of a Cataract in the ſeveral Degrees of its Progreſs, we ſhall perceive that it begins in the Seat of the Chryſtalline, and as its Opacity increaſes, it appears to riſe towards the Center of the Pupil, and that in its laſt State it admits Light to paſs between the Capſula of the Chryſtalline and inner Edge of the Pupil, in a ſufficient Quantity to diſcover Shades of Objects.

Whereas if a Cataract adhered to the inner Edge of the Pupil in all or part of its Circumference, it would not only proportionally hinder the Light from paſſing to the immediate Organ of Sight, but ſtop the free Motions of the *Iris*; and if we ſuppoſe from the Softneſs of its Texture it would not ſtop the Motions of the *Iris*, we muſt allow ſome Change in its Figure, depending on ſuch Motions; and ſince Experience makes it evident that the Cataract maintains very nearly, if not exactly, the Figure of the healthful Chryſtalline in every State of this Diſeaſe, we may very reaſonably conclude that no Cataract can be form'd from *Pus*, ſeparated by a Loſs of Continuity of the Veſſels of the *Uvea*.

They who maintain that a Cataract is an Alteration of the Chryſtalline Humour, have proved it by ſuch a vaſt Variety of unqueſtionable Experiments, that I think (in the Time I write) 'tis a generally receiv'd Opinion. I ſhall therefore only endeavour to demonſtrate that there are no membranous Cataracts, but that all Cataracts are an Alteration of the chryſtalline Humour itſelf.

The Queſtion is then, Whether there are membranous Cataracts? Or whether all Cataracts are an Alteration of the chryſtalline Humour?

Meſſieurs *Hecquet* (*a*), *Woolhouſe* (*b*), *St. Yves* (*c*), *Hovius* (*d*), *Morand* (*e*), *Geiſler* (*f*), *Gaſtaldi*

(*a*) 1. Remarques ſur l'utilité de la ſaigńee dans les maladies des yeux.

2. Sa Lettre ſur les maladies des yeux pour expliquer ce qui en a eté dit dans ſes remarques ſur l'utilité de la ſaignée dans les maladies des yeux.

(*b*) 1. Ses Diſſertations ſçavantes & Critiques ſur la Cataracte & le Glaucome.

2. Ses Obſervations ſur le Memoire Acadêmique de Monſ. *Morand*.

3. Son Memoire dans le Journal des Sçavans, *Decembre*, 1720.

(*c*) 1. Son Traité des maladies des yeux, *p.* 239.

2. Reponſe à une Lettre Critique de ſon Traité des maladies des yeux.

(*d*) De circulari humorum motu in oculis, *p.* 86.

(*e*) Ses Obſervations ſur la Cataracte dans l'hiſtoire de L'academie Royale des Sciences, l'année 1722.

(*f*) Sa Lettre écrite de *Nuremberg* ſur la Cataracte.

Gaſtaldi (g), *Dedier* (h), *Pinſon* (i), *Dubois* (k), *Frytag* (l), with many others, maintain both theſe Opinions, and aſſert, that there are membranous Cataracts, but that they are not ſo common as thoſe from an Alteration of the Chryſtalline.

On the contrary, Meſſieurs *Heiſter* (a), *Maitre-Jan* (b), *Briſſeau* (c), *Petit* (d), with many others, maintain that there are no membranous Cataracts, but that all Cataracts are from an Alteration of the chryſtalline Humour.

(g) Queſtio Medico-Chirurgica, *&c.* ſub hac verborum ſerie, an Cataracta à vitio humoris aquei aut cryſtallini oriatur, *&c.*

(h) Sa Lettre écrite à Mr. *Woolhouſe*, &c. *Vid.* Journal des Sçavans pour le mois de Juillet, 1722.

(i) Ses Obſervations ſur la Cataracte & le Glaucome.

(k) Suite des Maladies Chroniques V. 5.

(l) Diſſertatio Medica de Cataracta, *&c.*

(a) 1. De Cataracta, Glaucomate, & amauroſi Tractatio, *&c.*

2. Apologia & uberior explicatio ſyſtematis ſui de Cataracta, Glaucomate, & amauroſi, contra *Wolbuſii* ocularii *Pariſienſis* cavillationes & objectiones, itemque *Pariſienſis* Eruditor, *&c.*

3. Vindiciæ ſententiæ ſuæ de Cataracta, Glaucomate, & amauroſi, *&c.*

(b) Traité des Maladies de l'Oeil.

(c) Traité de la Cataracte & du Glaucoma.

(d) 1. Sa Lettre dans laquelle il démontre que le Criſtallin eſt fort prés de L'uveé, *&c.*

2. Sa Lettre contenant des reflections ſur ce que M. *Hecquet* a dit dans ſes Remarques ſur l'utilité de la ſaigneé dans les maladies des yeux.

3. Sur les deux eſpaces que l'humeur aqueuſe occupe dans l' oeil & ſur le Criſtallin & la Cataracte. V· Hiſtoire de l' Academie Royale des Sciences pour l'anneé 1722, 23, 25, 28, 30.

After having propos'd ſome Objections againſt the Sentiments of thoſe who favour the Exiſtence of a membranous Cataract; in order to determine this Queſtion, I ſhall enquire into the exact Situation of the Chryſtalline, the true Depth or Thickneſs of the Chambers of the aqueous Humour, and the Conſequences that muſt attend the Removal of this ſuppoſed membranous Cataract from he poſterior Chamber.

The celebrated *Dr. Petit* greatly favours the Opinion which maintains that all Cataracts are from an Alteration of the chryſtalline Humour; as appears in ſeveral of the Memoirs of the Royal Academy of *Paris*; and he ſupports this Opinion chiefly from his having proved by the following Experiment the exact Situation of the Chryſtalline, and Thickneſs of the Chambers of the aqueous Humour.

He ſeparated a human Eye from its Fat and Muſcles, and in that Situation it weighed 147 Grains and a half, and its Axis was 11 Lines one Third of Length; this Eye was a little flat on its Sides, under the ſtrait Muſcles, which made four irregular obtuſe Angles; it had 11 Lines one quarter, meaſur'd by two of its oppoſite flat Sides, from the Right to the Left, and 10 Lines one quarter by two of its oppoſite flat Sides, from the ſuperior to the inferior Parts.

The *Cornea* made by its Convexity the Portion of a Sphere of ſeven Lines and a half Diameter; the *Uvea* had five Lines of Diameter meaſur'd from the exterior Part of the *Cornea*. But five Lines and a half when meaſur'd from the interior Part of the *Cornea*, where the *Cornea* grows wider, by reaſon of its Inclination.

The Pupil had one Line and a half of Diameter, this was remarked after the Removal of the *Cornea*, which had the Thickneſs of $\frac{2}{12}$ of a Line. The *Cornea* and aqueous Humour being removed, he took away with a fine Sponge, all that remain'd of the aqueous Humour about the Surface of the Capſula of the Chryſtalline.—He weigh'd this Eye, and found leſs Weight by five Grains, which was the Weight of the aqueous Humour this Eye contain'd.—He then meaſur'd the Axis of the Eye, and found it nine Lines $\frac{2}{3}$, that is, one Line $\frac{2}{3}$ from the moſt prominent Part of the *Cornea*, to that of the Capſula of the Chryſtalline; from which, if we allow $\frac{2}{12}$ for the Thickneſs of the *Cornea*, the Thickneſs of the aqueous Chambers will be exactly one Line $\frac{1}{2}$.

The Chryſtalline formed by its anterior Part a Portion of a Sphere, of nine Lines in Diameter; it had four Lines $\frac{1}{2}$ in Bigneſs, and two Lines $\frac{1}{4}$ in Thickneſs; the Height of its Segment, had a little more than $\frac{3}{5}$ of a Line.

The Chryſtalline was incloſed in a tranſparent Capſula, continued from the Hyaloyde Membrane, to the *Ligamentum & proceſſus ciliares.* This Capſula confin'd the Chryſtalline in the Cavity of the Vitreous Humour; it did not adhere to any Part of the Chryſtalline, but was (as it always is) moiſtened with a little quantity of Liquor.—The Chryſtalline weighed four Grains $\frac{1}{4}$.

The vitreous Humour which fill'd all the reſt of the Eye, weigh'd ten Grains.—The Membranes weigh'd thirty-four Grains. If we put together the Weight of each of theſe Parts, the Total will be 147 Grains and a half for this Globe of the Eye.

There are ſeveral other ways of knowing the true Situation of the Chryſtalline, and Thickneſs of the aqueous Chambers. If we make an Opening into the right Side of the Globe, with the Point of a Lancet, about three Lines below the Edge of the *Cornea*, and another in the oppoſite Side, exactly at the ſame Diſtance from the *Cornea*; if after having enter'd a Needle at one of theſe Openings, and paſs'd it in a direct Line thro' the other, we cut round the *Sclerotis* immediately below the *Cornea*, remove the *Uvea*, open the Capſula of the Chryſtalline, and take the Chryſtalline from its Seat, we ſhall perceive that the Needle has paſs'd the poſterior Part of the Chryſtalline, without having touch'd the Chryſtalline in its Paſſage.

If alſo we make an Opening into the right Side of the Globe, with the Point of a Lancet, about $\frac{1}{3}$ of a Line below the Edge of the *Cornea*, and another in the oppoſite Side, exactly at the ſame Diſtance from the *Cornea*; if after having enter'd at one of theſe Openings a ſmall *plano*-Convex Needle, with its plain Surface directed towards the fund of the Globe, and paſs'd it, in a direct Line, through the other, we cut round the *Sclerotis*, immediately below the *Cornea*, and remove the *Uvea*, we ſhall perceive the plain Surface of the Needle immediately placed on the anterior Surface of the Capſula of the Chryſtalline,

And we may determine with great Exactneſs, the Thickneſs of the aqueous Chambers, by examining with Attention the Origine, and Inſertion of the *Ligamentum ciliare*, and remembering that this Ligament never exceeds $\frac{3}{4}$ of a Line in Length.

By theſe Experiments, we learn the impoſſibility of removing this ſuppoſed membranous Cataract from the poſterior Chamber of the Aqueous, without violenly breaking or ſeparating the *Ligamentum ciliare* from its Adheſion to the Capſula of the Chryſtalline.

And by theſe Experiments we learn, that if to avoid breaking or ſeparating the *Ligamentum ciliare*, in an Endeavour to remove this ſuppoſed membranous Cataract, we ſhould paſs the Needle into the aqueous Chamber, by directing its Point from below its Inſertion, to the Capſula of the Chryſtalline, we muſt make ſuch an Opening into the poſterior and anterior Parts of this Capſula, as to render it incapable to continue the Chryſtalline in its healthful Seat. — Thus the Chryſtalline being no longer confined in its Capſula, would leave its Situation in the *Vitreous*, and fall on the *Uvea.*

But even this Care is never taken by thoſe who favour the Exiſtence of a Membranous Cataract; for by what I have ſeen, and by all the Accounts that have come to my Knowledge, the Operation which has ever been univerſally practiſed, conſiſts only in paſſing a Needle a little behind the *Cornea*, and directing it to the ſuperior Part of the Cataract, and afterwards in endeavouring to place the Cataract a little below the inferior and inner Surface of the *Uvea.* Thus from the above Experiments it appears, That the Needle muſt act as much in the Seat of the Chryſtalline, as in the aqueous Chamber, and conſequently muſt act as much on the Chryſtalline, as in this ſuppoſed Membrane.

And ſuppoſe the Needle was enter'd into the Poſterior Chamber of the aqueous, without wounding the *Ligamentum ciliare*, or Capſula of the Chryſtalline, it will be very difficult to conceive how a Needle of $\frac{1}{3}$ of a Line in its Diameter, ſhould move in that Chamber; much leſs that it ſhou'd change its Situation, in a manner neceſſary to the Removal of this ſuppoſed membranous Cataract; ſince it appears by the moſt exact Enquiry, that the Thickneſs of the poſterior Chamber of the aqueous never exceeds $\frac{1}{4}$ of a Line, when the aqueous Humour, (which is at this Time diſcharged) is contained in it.

From what I have ſaid it appears, that thoſe who favour the Exiſtence of a membranous Cataract, muſt not only neceſſarily admit of a different manner of removing it, from that of a diſeaſed Chryſtalline, but alſo have ſome certain way of knowing the one from the other. —— For if before the Operation they ſhould judge it a Cataract, from an Alteration of the Chryſtalline, when it was a Membrane in the poſterior Chamber of the aqueous: By endeavouring to remove this Cataract, they muſt effectually deſtroy the healthful Chryſtalline, by forcing it through its Capſula, or forcing it with its Capſula, from the *Ligamentum ciliare.* And, ſuppoſe, during the Progreſs of ſuch an Operation, they find their Miſtake, and immediately return their Needle into the ſuperior Part of the poſterior Chamber of the aqueous, in order to remove this ſuppoſed Membrane, it would be impoſſible for them, (as I have already obſerved) to paſs the Needle into that Seat of the aqueous, without violently breaking or ſeparating the *Ligamentum ciliare* from its Adheſion to the Capſula of the Chryſtalline; and the aqueous Humour being diſcharged, the Chryſtalline, with its Capſula, muſt neceſſarily fall on this ſuppoſed Membrane, and force it ſo irregularly on the *Uvea*, that no Endeavours could remove it, without deſtroying the Uſes of the Chryſtalline, and expoſing the Patient to great Danger.

Thus they would not only be effectually diſappointed of any immediate Succeſs, but in all Probability occaſion an irrecoverable Loſs of Sight.

And if before the Operation, they ſhould judge it a Cataract, from an Alteration in the poſterior Chamber of the Aqueous, when it was a diſeaſed Chryſtalline; by endeavouring to remove this Cataract, they muſt ſo change the healthful Situation of the diſeas'd Chyſtalline, or force it through its Capſula on the *Uvea*; that on finding their Miſtake, it would be impoſſible for them to depreſs this alter'd Chryſtalline, without expoſing the Patient to the utmoſt Danger.

And if it appear'd that they had any certain Signs of knowing this Membranous Cataract, from that of a diſeaſed Chryſtalline. The Situation of the Chryſtalline, its Capſula and *Ligamentum ciliare*. — The Smallneſs of the poſterior Chamber of the Aqueous. — The Impoſſibility of moving a Neea Needle in that Chamber, of a proper Diameter, to remove ſuch a Membrane. — The Injury that would probably attend the *Uvea*, in the Progreſs of the Operation from the Diſcharge of the aqueous Humour. — The wounding or forcibly ſeparating the Parts of the *Ligamentum ciliare*, and the Change that muſt neceſſarily happen in the Situation of the Chryſtalline, ſufficiently prove that Sight could never be reſtor'd by any Operation poſſible to be attempted to remove this ſuppos'd Membrane; but on the contrary, every ſuch Attempt muſt bring on the moſt dangerous Conſequences.

By this way of Reaſoning I was at firſt inclined to believe, that all Cataracts were from an Alteration of the Chryſtalline; and was afterwards ſtrengthned in my Opinion, from the vaſt Number of Errors in the Sentiments of thoſe who favour the Exiſtence of a membranous Cataract. And my Opinion receiv'd further Support, from having never found any Alteration in the poſterior Chamber of the Aqueous, that had the leaſt Analogy to the Account we have of a Membranous Cataract; but have always remarked in examining the Pupil, from the firſt Appearances of every Species of this Diſeaſe, Degrees of Whiteneſs, and Opacity in the Seat of the Chryſtalline; and that in the Progreſs of their Symptoms, this Whiteneſs and Opacity has always continued in that Seat, advancing towards the Center of the Pupil, and maintaining nearly, if not exactly, the Figure of a healthful Chryſtalline.

Beſides, if a Cataract could be formed by any Alteration in the poſterior Chamber of the Aqueous, I might reaſonably have expected to have ſeen one Inſtance in ſuch a vaſt Number of Diſorders of this Kind, which have preſented to my Care; and I muſt of Neceſſity have known it from that of a diſeas'd Chryſtalline, from its Figure, Situation, and Opacity, conſider'd from the Make of the poſterior Chamber of the aqueous.

Since therefore not one Inſtance of a membranous Cataract has preſented to my Obſervation, notwithſtanding I have been long favour'd with a very extenſive Practice in the Diſeaſes incident to the Eye; and that if ſuch an Inſtance could be found, it appears impoſſible to account for its Formation, or to remove it, without effectually deſtroying the eſſential Parts of Sight, I am perſuaded that there are no Cataracts but what are from an Alteration of the chryſtalline Humour.

CHAP. II.

Of the Definition of the Cataract.

BY a Cataract I underſtand a diſeas'd Alteration of the Chryſtalline, attended with Degrees of an unequal Opacity and Colour, Loſs of Diameter, preternatural Change of its Conſiſtence, Magnitude, Figure, Gravity, and Situation, where the Chryſtalline maintains one unequal Continuity, while thro' all its Parts its Capſula ſtill continues to have its healthful Tranſparency; and in another State of it, it has Degrees of equal Opacity and Colour, Increaſe of Diameter, preternatural Change of its Conſiſtence, Gravity, and Situation; and here the Chryſtalline ſuffers a Solution of Continuity in ſome or all of its Parts, with a diſeas'd Alteration of its Capſula. The former I call the true, and the latter the falſe Cataract.

CHAP. III.

Of the Cauſes of the ſeveral Species of the true Cataract.

AUthors are not agreed about the Cauſes of the true Cataract; ſome pretend that it is owing to Degrees of a preternatural Viſcidity, in that Fluid brought for the Supplies of the Chryſtalline, which by poſſeſſing Particles of an improper Magnitude, may be ſo irregularly lodg'd in its Veſſels, as to deſtroy that Equality ſo neceſſary to Tranſparency. Others, on the contrary, deduce this Opacity of the Chryſtalline from an Inflammation of the Blood, and preternatural increas'd Momentum of that Fluid with which the Chryſtalline is ſupply'd; for in that Caſe groſs Particles, inconſiſtent with Tranſparency, may be impell'd into the lymphatick Veſſels, of which it is compos'd. And others attribute this diſeas'd Alteration of the Chryſtalline, to a Defect in that Liquor which is found between the Chryſtalline and its Capſula, and obſerve, that when the Veſſels intended to convey the Supplies to the

Chryſtalline happen to be obſtructed, from any diſeas'd Alteration of their Contents, the Liquor contain'd under the Capſula of the Chryſtalline turns ſowre, whence follow all the Alterations obſervable to attend the ſeveral Species of this Diſeaſe.

Since this Diſeaſe happens to thoſe who are the moſt healthful and temperate, and the moſt free from viſcid or inflam'd Blood, great Variety of Objections muſt neceſſarily be remov'd to make any of theſeOpinions reaſonable; which has induc'd me to believe, that theſe Diſeaſes are owing to a preternatural, forcible, and irregular Contraction of any one or more of the Muſcles of the Globe, by which the Parts of the Chryſtalline are more or leſs violently and irregularly preſs'd; and that the Degrees of their Conſiſtence, Magnitude, Figure, Colour, Gravity, Situation, and Opacity, depend on the Degrees of Strength, and Uniformity of this Preſſure; and that the Cauſe of this preternatural, forcible, and irregular Contraction of any one or more of the Muſcles of the Globe, is owing to the Deficiency of the Supplies of that Fluid, ſo neceſſary to their Senſation and Motion; and that the Cauſe of the Deficiency of ſuch Supplies, is owing to a long, conſtant Direction of the Axis of the Eye to particular Objects, by requiring in a limited Time a greater Supply to particular Muſcles of the Globe, than what is agreeable to the natural and healthful Courſe of ſuch Supplies; and this Deficiency of the Supplies to particular Muſcles of the Globe, may occaſion ſuch Muſcles to act with a degree of Strength different from thoſe which act in Oppoſition to them; whence follows an Irregularity in the general Action of all theſe Muſcles.

From this preternatural Action of theſe Muſcles, the Globe ſuffers different Changes in its Figure, by which the ſeveral Parts of its Contents are differently forced from their healthful Situation; and the *Ligamentum Ciliare* being fix'd to the Circumference of the Capſula of the Chryſtalline, and the aqueous Humour lying immediately on the anterior Parts of this Ligament, and the vitreous on its poſterior; the chryſtalline Humour being thus confin'd in its Capſula, between the two Surfaces of theſe Humours, the preternatural Preſſure which is thus made on them, muſt neceſſarily be continu'd to the two Surfaces of the Capſula and the Chryſtalline; and in proportion to the Degrees of Strength, and Uniformity of this Preſſure, the Chryſtalline muſt not only ſuffer a diſeas'd Alteration in ſome or all of its Parts, but the whole Chryſtalline muſt be chang'd from its healthful Situation in its Capſula.

From the Degrees of the Irregularity and Force of this preternatural Preſſure, with the Change of Situation of the Chryſtalline in its Capſula, we may account for all the various Appearances which accompany the Progreſs of each Species of this Diſeaſe.

That the preternatural, forcible, and irregular Contraction of one or more Muſcles of the Globe, is the Cauſe of the ſeveral Species of the true Cataract, is further evident from thoſe Alterations of the Chryſtalline which ſometimes ſucceed a Blow receiv'd near the Eye; for the Alterations of the Figure of the Globe, from the irregular and violent Action of any one or more of its Muſcles in ſuch a Caſe, are the ſame in a greater degree, as the irregular and violent Action of any one or more of theſe Muſcles ariſing from any other; becauſe from the violent, ſudden and irregular Change of the Figure of the Globe ariſing from this Blow, the Chryſtalline is preſs'd with ſuch Violence towards the *Uvea*, as not only to change it from that Situation in its Capſula ſo neceſſary to receive its Supplies, but alſo to force it into the poſterior Chamber of the aqueous; thus there is ſuch an entire Stop put to the healthful Circulation of the fluid Contents of the Chryſtalline, and ſuch a Change made in the Continuity of its Parts, that all the Parts of the Chryſtalline immediately obtain a greater degree of Opacity than could have happen'd in a long time by a leſs degree of this Preſſure, where the Chryſtalline maintains its Seat in its Capſula; this is that diſeas'd Alteration of the Chryſtalline known by the Name of the *ſhaking Cataract*, and ſo call'd from its continually changing its Situation behind the *Uvea.*

That the preternatural, forcible, and irregular Contraction of any one or more of the Muſcles of the Globe is the Cauſe of the ſeveral Species of the true Cataract, is further evident from obſerving that it always affects ſuch as have employ'd much Time in reading, or viewing particular Objects.

CHAP. IV.

Of the diagnoſtick and prognoſtick Signs, and Cure of the ſeveral Species of the true Cataract.

THE diagnoſtick Signs of the ſeveral Species of the true Cataract are known from the Situation, Colour, and Degrees of an unequal Opacity of the anterior Surface of the diſeas'd Chryſtalline.

In the firſt State of this Diſeaſe, we perceive Degrees of a ſmall Cloudineſs more im-

immediately near the Seat of the Center of the Chryſtalline.

And the reaſon of this ſmall Cloudineſs or Opacity appearing near the Center of the Seat of the Chryſtalline, is from the central Diameter of the Chryſtalline being greater, and conſequently containing a greater Number of theſe alter'd Parts.

In the ſecond State of this Diſeaſe, we perceive the Opacity of the Chryſtalline to be increas'd, and to be continu'd thro' all the Seat of the Chryſtalline, but more immediately in its Center, to maintain the healthful Figure of the Chryſtalline, to be advanc'd towards the Center of the Pupil to near half the Thickneſs of that Part of the poſterior Chamber of the aqueous, between the inner Edge of the Pupil and the moſt prominent Part of the Capſula of the Chryſtalline, to have degrees of a Mixture of a pale white and blue Colour, and to continue to impower the Patient to ſee Shades of Objects in a direct Line from the Axis of the Eye.

In the laſt State of this Diſeaſe we perceive the Opacity of the Chryſtalline to be greatly increas'd, and to be very unequal in all its anterior Parts, to maintain very nearly the Figure of the healthful Chryſtalline; to be ſo conſiderably diminiſh'd in its Volume, as to have the Thickneſs of that Part of the poſterior Chamber of the aqueous, between the inner Edge of the Pupil and the moſt prominent Part of the Capſula of the Chryſtalline, $\frac{1}{4}$ greater than in its healthful State; to have degrees of a Mixture of various Colours, and to permit a ſufficient Light to paſs between the Edge of the Pupil and anterior Circumference of the Capſula of the Chryſtalline, ſo as to impower the Patient to ſee Shades, Colours, and ſometimes the Figures of many Objects.

The prognoſtick Signs of this Diſeaſe being curable, depend in general on the Perfection of the immediate Organ of Sight; and even in its firſt State it is ſeldom remov'd without the Operation.

To remove the firſt Symptoms of this Diſeaſe, I only recommend the Patient to abſtain from all ſuch Work as may command great Attention of Sight, ſuch as reading, writing, ſewing, *&c.* to keep the Eyes from receiving Light from any very luminous Object, and to cauſe a Shade to be ſo fix'd before the Eyes ſo as to prevent the Light from falling immediately within the Axis of the Eye.

The ſecond and laſt State of this Diſeaſe will admit of no Remedy but the Operation.

C H A P.

CHAP. V.

Of the Cauſes of the ſeveral Species of the falſe Cataract.

THeſe diſeas'd Alterations of the Chryſtalline are always preceded by an apparent Plenitude, Diſtention, and preternatural Change of the Contents of the ſanguine and lymphatick Arteries in all the Parts of the Globe, ariſing from ſome diſeas'd Alteration of the Blood, by which its Momentum is ſo increas'd as to force into the Veſſels of the Chryſtalline (from the Extremities of thoſe Arteries employ'd in the Service of their Supplies) certain Particles of an improper Quality to maintain their healthful Continuity.

And from the different Quality and Number of theſe diſeas'd Particles, ſome or all the Parts of the Chryſtalline paſs thro' ſuch various diſeas'd Alterations of Plenitude, Solution of Continuity, and Opacity, as to have ſome, or all of its Parts, chang'd into the Conſiſtence of Milk, Cream, and ſometimes to a Matter which has ſome Analogy in its

Conſiſtence and Colour to that of *Pus*; which by degrees ſo alter the Direction of the Fibres of the Capſula, as to render it opake; and this alter'd Chryſtalline being contain'd in its Capſula as in a Bag, has obtain'd various Denominations, ſuch as, *the bag*, *the milky*, and *the purulent Cataract*.

CHAP. VI.

Of the diagnoſtick and prognoſtick Signs, and Cure of the ſeveral Species of the falſe Cataract.

THE preceding *Opthalmia* being entirely removed, the Patient continues to complain of Degrees of Pain from Light, and of a very great Diminution of Sight; on examining the Pupil, we perceive Degrees of a ſmall Opacity continu'd thro' the whole Seat of the Chryſtalline, and that this Opacity maintains the Figure of the healthful Chryſtalline, and is of a clear blueiſh Colour.

In the ſecond State of this Diſeaſe the Patient complains of ſuch a Defect of Sight, as to be unable from any Direction of the Axis of his Eye to ſee more than the Shades and Colours of certain Objects; on examining the Pupil, we perceive the Opacity of the Chryſtalline to be very greatly increas'd, to continue maintaining the healthful Figure of the Chryſtalline, and to be advanc'd towards the Center of the Pupil to near half the Thickneſs of that Part of the poſterior Chamber of the aqueous, between the inner Edge of the Pupil and the moſt prominent Part of the Capſula of the Chryſtalline, and to have Degrees of a white and blue Colour.

In the laſt State of this Diſeaſe the Patient complains of ſuch an entire Loſs of Sight, as to be only ſenſible of a very little Light to paſs between the inner Edge of the Pupil and Circumference of the Capſula of the Chryſtalline, but not ſufficient to diſcover the Shade or Colour of any Object; on examining the Pupil, we perceive the alter'd Chryſtalline to be ſo conſiderably increas'd in its Volume, as to appear to be immediately placed on the inner Edge of the Pupil; to continue maintaining the Figure of the healthful Chryſtalline, and to be of a dark white and yellowiſh Colour.

The prognoſtick Signs of Cure in this Diſeaſe are always very doubtful, and any Remedy very precarious, according to the different Temperament of the Patient, and the Probability of being injudiciouſly treated.

To remove the firſt Symptoms of this Diſeaſe, I recommend an attenuating medicinal Diet, general Evacuations, particularly bleeding of the Temporal Artery, Cupping behind the Ears, *&c.* with the Aſſiſtance of Collyriums, and ſpirituous Fomentations with Camphire, — to keep the Eyes from receiving Light from any very luminous Objects, and to cauſe a Shade to be ſo fix'd before the Eyes, as to ſtop the Light from falling immediately within the Axis of the Eye.

CHAP. VII.

Of the Definition of the Glaucoma.

BY a *Glaucoma* I underſtand a diſeas'd Alteration of the Chryſtalline, where the Chryſtalline maintains one exact equal Continuity thro' all its Parts, with a diſeas'd Alteration of its Capſula, attended with degrees of a very equal Opacity and Colour, very great Increaſe of Diameter, preternatural Change of its Conſiſtence, Gravity, and Situation; and in its laſt State with an Elevation, Dilatation, and Immobility of the Pupil, and *Gutta Serena.*

CHAP. VIII.

Of the Cauſes of the ſeveral Species of the Glaucoma.

THeſe diſeas'd Alterations of the Chryſtalline are always preceded by a preternatural Viſcidity of the Blood; and are owing to the Degrees of the Quantity, Momentum, and Viſcidity of that Fluid brought for the Supplies of the Veſſels of the Chryſtalline.

And from the Degrees of the Quantity, Momentum, and Viſcidity of this Fluid, all the Veſſels of the Chryſtalline ſuffer various Degrees of an equal Plenitude, Opacity and Colour, till the Circulation of their Contents entirely ceaſe.

And this preternatural Plenitude of the Contents of theſe Veſſels by degrees ſo increaſes the Volume of the whole Chryſtalline, as to place its anterior Surface immediately behind the inner Circumference of the Pupil.

And in a further Increaſe of the Plenitude of the Contents of theſe Veſſels, the Volume of the Chryſtalline is ſo greatly augmented, as to raiſe the Circumference of the Pupil towards the *Cornea*, and violently preſs on the *Uvea.*

And by this great Increaſe of the Volume of the Chryſtalline, the Plenitude of the Globe is ſo greatly augmented, as to occaſion Degrees of a preternatural Preſſure on the immediate Organ of Sight.

And this preternatural Preſſure on the *Uvea* and immediate Organ of Sight, is attended with Degrees of a violent Pain immediately in the Fund of the Globe, which continues in degree till in the laſt State of this Diſeaſe there is a Stop put to the Circulation of the Contents of the Veſſels of the Chryſtalline, and conſequently to the Augmentation of it, and Plenitude of the Contents of the whole Globe.

CHAP. IX.

Of the diagnoſtick and prognoſtick Signs, and Cure of the ſeveral Species of the Glaucoma.

WHEN the Patient begins to complain of a Diminution of Sight, on inſpecting the Pupil, we perceive Degrees of a ſmall Opacity continu'd thro' the whole Seat of the Chryſtalline; that the Chryſtalline maintains its healthful Figure, and that the Volume of the Chryſtalline is ſo increas'd, as to appear immediately plac'd behind the inner Circumference of the Pupil.

In the ſecond State of this Diſeaſe, the Patient complains of Degrees of the moſt violent Pain in the fund of the Globe, and of ſuch a Diminution of Sight, as to be unable, from any Direction of the Axis of the Eye, to ſee more than the Shades and Colours of certain Objects. On examining the Pupil, we perceive the Volume of the Chryſtalline to be ſo greatly augmented, as to have raiſed the Circumference of the Pupil towards the *Cornea*, to near $\frac{1}{4}$ of the healthful Thickneſs of the anterior Chamber of the aqueous, that the alter'd Chryſtalline continues to maintain its healthful Figure, and appears of a dark bluiſh Colour.

In the laſt State of this Diſeaſe, the Patient complains no longer of Pain, but of ſuch an entire Loſs of Sight, as to be even inſenſible of Light. On examining the Pupil, we perceive the Chryſtalline to be ſo greatly augmented in its Volume, as to have raiſed the Circumference of the Pupil towards the *Cornea*, to near $\frac{1}{3}$ of the healthful Thickneſs of the anterior Chamber of the

Aqueous; that the alter'd Chryſtalline continues to maintain its healthful Figure, and appears of a pale Green Colour.

The Prognoſtick Signs of the Cure of this Diſeaſe are always exceeding dangerous, and never admit of any certain Remedy for the Recovery of Sight, but in its firſt State; and then only from the Operation.

However, the Cure may be attempted in its firſt State, by a warm attenuating medicinal Diet, Bleeding, Cupping, repeated Emeticks, *&c.* with the Aſſiſtance of Colliriums, and Spirituous Fomentations, — to keep the Eyes from receiving Light from any very luminous Objects, and to cauſe a Shade to be ſo fix'd before the Eyes, as to keep the Light from falling immediately within the Axis of the Eye.

The ſecond and laſt State of this Diſeaſe, will admit of no Remedy, for the Recovery of Sight; and the palliative Cure conſiſts in an attenuating Medicinal Diet, warm Bathing, Bleeding in the temporal Arteries, Cupping behind the Ears, *&c.*

CHAP. X.

Of the Regimen neceſſary to precede my new Operations for the ſeveral Species of the true Cataract, and the ſeveral Species of the Cataract called the ſhaking Cataract. --- For the ſeveral Species of the falſe Cataracts, and the ſeveral Species of that State of the Glaucoma, *where the* Iris, *and immediate Organ of Sight, maintain their healthful State.*

SINCE a perfect Knowledge of the Animal OEconomy, is in no Caſe more required, than in the Treatment neceſſary to theſe Operations, (which, of all others, are infinitely the moſt difficult, and attended with the greateſt Variety of Accidents)

dents) they ought never to be attempted, but with the Aſſiſtance of a Phyſician.

I ſhall therefore only recommend an attenuating Medicinal Diet, with gentle Evacuations ſome Days before the Operation.

Of the Manner of making my New Operations neceſſary to the Removal of the ſeveral Species of the true Cataract, and the ſeveral Species of the Cataract call'd the Shaking Cataract. For the ſeveral Species of the falſe Cataract, and for the ſeveral Species of that State of the Glaucoma, *where the* Iris *and immediate Organ of Light maintain their healthful State.*

CHAP. XI.

Of the Manner of making my New Operation for the ſeveral Species of the true Cataract.

HAving plac'd my Patient in the uſual Poſition, I fix my Speculum, and with a Lancet make a ſmall Longitudinal Inciſion, of about half a Line in Length, through the outward and inward Membranes of the Globe, into the vitreous Humour. I make this Inciſion about one Line and a half below that Part of the lateral and outward Edge of the *Cornea*, ſituated about two Lines below a Line drawn Parallel to the greater and leſſer *Canthus* of the Eye. I then paſs, in a perpendicular Direction to the Globe of the Eye, a *plano*-Convex Needle of about one ſixth of a Line in Thickneſs, through its moſt Convex Part, and one third of a Line in its greateſt Diameter, with its Convex Surface towards the ſuperior Part of the Orbit, into the Opening I have made in the Globe with the Lancet. My Needle thus enter'd, I direct its Point about two Lines into the Body of the Vitreous, then very ſlowly bring my Needle forward with its Surfaces in the ſame Direction, 'till its Point is brought about a Line below a Line drawn Parallel to the inferior Inſertions of the *Ligamentum Ciliare*, with the Capſula of the Chryſtalline, and about the ſame Diſtance from the Capſula. I then continue my Needle about one Line forward, in the ſame Direction, and thus paſs its Convex Surface, under the inferior Surface of the Capſula of the Chryſtalline, about a Line below it, and about the ſame Diſtance below the inferior Inſertions of the *Ligamentum Ciliare.* I then gently raiſe my Needle in the ſame Direction, 'till its Convex Surface ſuffers ſome ſmall Reſiſtance from the Chryſtalline, which I judge with great Exactneſs, by inſpecting the Pupil, and obſerving a Motion in the alter'd Chryſtalline. And being thus aſſured that the Convex Part of my Needle is placed immediately under ſome Part of the Capſula of the diſeas'd Chryſtalline, I gently raiſe the Chryſtalline about a third or fourth Part of a Line, to learn, with ſome Exactneſs, on what Part of the Capſula the Convex Part of my Needle is placed; and if on inſpecting the Pupil, I perceive that the anterior Surface of the Capſula of the Chryſtalline is not continued in a direct Line, at the ſame Diſtance from all the inner Surface of the *Uvea*, but approaches nearer to, or recedes farther from it, I very ſlowly continue my Needle towards the inferior Part of the Globe, with its Surfaces in the ſame Direction, and its anterior Edge at the ſame Diſtance from the inner Surface of the *Uvea*, and Inſertions of the *Ligamentum Ciliare*, 'till I judge the Convex Part of my Needle, about the ſame Diſtance below the inferior Surface of the Capſula, and Inſertions of the *Ligamentum Ciliare*, as it was immediately preceding its being firſt placed under this Capſula. I then replace the Convex Surface of my Needle, on the inferior Surface of the Capſula of the Chryſtalline, nearer or farther from the inferior and inner Surface of the *Uvea*, or nearer or farther from the Inſertions of the *Ligamentum Ciliare*, according to the Direction I received from the Motion of the alter'd Chryſtalline: And when I find by ſuch a Motion, that the Convex Surface of my Needle is ſo exactly placed under its Capſula, that on raiſing it towards the ſuperior Part of the Orbit, the anterior Surface of the Capſula of the Chryſtalline would be continued, in a direct Line, at the ſame Diſtance from all the inner Surface of the *Uvea*: I again raiſe the Chryſtalline about a thitd of a Line towards the ſuperior Part of the Orbit, and inſtantly withdraw my Needle about two Lines, continuing its Surfaces in the ſame Direction and Diſtance from the ſuperior and inferior Part of the Globe, and thus permit the inferior Surface of the Capſula of the Chryſtalline to return to its former Situation. — The moſt prominent Part of the inferior Surface of this Capſula, being now about the ſame Diſtance below the Point of my Needle, as it was raiſed from its Situation by the Convex Part of it, I direct the Point of my Needle, with ſome Violence, about two Lines forward, with its Surfaces at the ſame Direction and Diſtance from the ſuperior and inferior Parts of the Globe: And thus the Point of my Needle paſſes through the Capſula and Chryſtalline, about a Line forward from its Entrance. I then forcibly break through thoſe Parts of the Chryſtalline, and its Capſula, over which my Needle is placed, and thus make an Opening in the inferior Part of the Capſula; obſerving by this Action, that my Needle forcibly enters about two Lines into that Part of the Vitreous. — I then withdraw my Needle about three Lines in the ſame Direction it falls in, and gently raiſe its Point towards the ſuperior Part of the Globe, about a Line above a Line drawn parallel to the ſuperior and lateral Surface of the Capſula of the Chryſtalline,

ſtalline, and Inſertions of the *Ligamentum Ciliare.* I then continue my Needle forward, with its Surfaces in the ſame Direction, 'till I judge its Point be about a Line above the moſt prominent Part of the ſuperior Surface of the Capſula. I then gently raiſe my Hand, 'till the inferior Surface of my Needle ſuffers ſome ſmall Reſiſtance from the Chryſtalline; which I judge of, as before, with great Exactneſs, by inſpecting the Pupil, and obſerving the Motion of the alter'd Chryſtalline. And being thus aſſured that the plain Surface of my Needle is immediately placed on ſome Part of the ſuperior and lateral Surface of the Capſula of the Chryſtalline, I gently depreſs the Chryſtalline about a third or fourth Part of a Line, to learn, with ſome Exactneſs, on what Part of the Capſula my Needle is placed: And if on inſpecting the Pupil, I perceive that the anterior Surface of the Chryſtalline is not continued, in a direct Line, at the ſame Diſtance, from all the inner Surface of the *Uvea*, but approaches nearer to, or recedes farther from it; I very ſlowly raiſe my Needle towards the ſuperior Part of the Globe, with its Surfaces in the ſame Direction, and its anterior Edge at the ſame Diſtance from the ſuperior and inner Surface of the *Uvea*, and Inſertions of the *Ligamentum Ciliare*, 'till I judge the plain Surface of my Needle about the ſame

Diſtance above the ſuperior and lateral Surface of the Capſula of the Chryſtalline, and Inſertions of the *Ligamentum Ciliare*, as it was immediately preceding its being placed on this Capſula. — I then replace the plane Surface of my Needle, on the ſuperior and lateral Surface of the Capſula of the Chryſtalline, nearer or farther from the ſuperior and inner Surface of the *Uvea*, or nearer to, or farther from the ſuperior and lateral Inſertions of the *Ligamentnm Ciliare*, according to the Direction I received from the Motion of the alter'd Chryſtalline; and when I find by the Motion of the alter'd Chryſtalline, that the plane Surface of my Needle is ſo exactly placed on its Capſula, that on continuing it towards the inferior Part of the Orbit, the anterior Surface of the Capſula of the Chryſtalline would be continued in a direct Line, at the ſame Diſtance from all the inner Surface of the *Uvea*; I again depreſs the Chryſtalline, about half a Line towards the inferior Part of the Globe; and by this Motion of my Needle, I enlarge the Opening I made in the inferior Part of the Capſula. I then once more very ſlowly raiſe my Needle towards the ſuperior Part of the Globe, with its Surface in the ſame Direction, and its anterior Edge at the ſame Diſtance from the ſuperior and inner Surface of the *Uvea*, and Inſertions of the *Ligamentum Ciliare*, as it was immediately preceding its being firſt placed on the ſuperior Surface of the Capſula of the Chryſtalline. I then replace the plane Surface of my Needle, about a Line farther towards the poſterior Part of the Capſula, or about a Line farther from the ſuperior Inſertions of the *Ligamentum Ciliare.* My Needle thus placed, I continue it very ſlowly, directing its plane Surface immediately towards the Opening I made in the inferior Part of the Capſula of the Chryſtalline; and when I have thus forcibly paſs'd the greater Circumference of the diſeaſed Chryſtalline, the remaining Part of it inſtantly follows. Thus the alter'd Chryſtalline falls into thoſe Parts of the Vitreous through which I paſs'd my Needle, after having broke through the inferior Parts of the Chryſtalline, and its Capſula.

During this Change of Situation of the alter'd Chryſtalline, I continue the plane Surface of my Needle on the ſuperior and poſterior Part of its Capſula, till I perceive it in its Paſſage on the Capſula about the Center of the Axis of the Eye, when inſtantly I raiſe the anterior Edge of my Needle towards the ſuperior Part of the Orbit, and in this Direction paſs it with great Exactneſs behind the inferior Surface of the *Uvea.* My Needle thus plac'd, with great quickneſs, I turn its plane Surface towards the inferior

Part of the Globe, and thus it neceſſarily falls on ſome of the Parts of the preſent ſuperior Surface of the alter'd Chryſtalline. My Needle thus plac'd on the preſent ſuperior Surface of the Chryſtalline, I inſtantly direct its anterior Edge towards the inferior Part of the inner Surface of the *Uvea*; and by thus changing the Direction of my Needle, its plane Surface is brought about the ſame diſtance towards the preſent anterior Surface of the alter'd Chryſtalline. The plane Surface of my Needle being now obliquely ſituated on the poſterior Part of the Globe, I continue my Needle in the ſame Direction to about a Line below a Line drawn parallel to the Center of the Globe, and thus place the Chryſtalline near the inferior and lower Parts of the *Vitreous*. — I continue my Needle about a Minute thus plac'd on the preſent anterior Surface of the diſeas'd Chryſtalline; and after raiſing the Needle's anterior Edge, till its convex Surface is immediately directed towards the ſuperior Part of the Orbit, I very ſlowly take it out of the Eye in the ſame Direction.

By thus paſſing the diſeas'd Chryſtalline thro' the Opening I made in its Capſula, the ſuperior Part of this Capſula being ſuſpended by its Adheſions to the *Ligamentum Ciliare*, the ſuperior and poſterior Parts of the alter'd Chryſtalline paſs with great Facility from under its Capſula, not only becauſe of the Aſſiſtance it receives by the Needle, but by the Help of the *Vitreous*, which at this time neceſſarily comes forward with ſome degree of Force, to give place for the ſudden Reception of the alter'd Chryſtalline.

And from this ſlow and regular Paſſage of the alter'd Chryſtalline thro' the Opening I made in its Capſula, the concave *Vitreous* muſt neceſſarily change its Situation, and riſe with great Exactneſs immediately behind the ſuperior and poſterior Surface of this Capſula.

The Chryſtalline being thus paſs'd out of the Axis of the Eye, and the ſuperior and poſterior Parts of its Capſula thus forc'd on the ſuperior and inner Surface of the anterior, it is thus the anterior, and Part of the Circumference of the poſterior Part of the Capſula, become immediately ſeated before the Membrane of the now convex *Vitreous*; and thus the Figure of the now convex *Vitreous* is the ſame with that of the healthful Chryſtalline.

If we believe that the *Ligamentum Ciliare* is in any manner neceſſary to our ſeeing Objects at different Diſtances, whether from altering the Figure, or changing the Situation of the Chryſtalline; ſuch Uſes of it are very nearly preſerv'd after this Operation, as in a healthful Eye; for the diſeas'd Chryſtalline thus paſs'd thro' an Opening in its Capſula, and the *Ligamentum Ciliare* maintaining its healthful Adheſions, the Capſula its healthful Figure, and diſtance from the *Cornea*, and the aqueous Chambers their healthful Plenitude; it follows that the *Ligamentum Ciliare*, by altering the Convexity of the Capſula, muſt neceſſarily place the Surface of the convex *Vitreous* nearer to, or farther from the immediate Organ of Sight, with very nearly, if not exactly, the ſame Degrees of Strength, as when the Capſula poſſeſs'd its healthful Contents.

But if we conſider, that in the ordinary Operation for the Removal of the Cataract, the *Ligamentum Ciliare* is always forcibly ſeparated from its Adheſions to the Capſula of the Chryſtalline, and by conſequence ſuch Uſes of it effectually deſtroy'd; we ſhall have very good reaſon to believe that the *Ligamentum Ciliare* has no ſuch Power, ſince we have many Inſtances of the Sight having been ſo reſtor'd by it, as to have enabled the Patient to ſee Objects at different Diſtances.

CHAP. XII.

Of the Reaſons of making my new Operation neceſſary to the Removal of the ſeveral Species of the true Cataract, as directed in the preceding Chapter.

I Paſs my Needle in a perpendicular Direction to the Globe of the Eye, with its convex Surface towards the ſuperior Part of the Orbit, that by the ſucceeding Motions of my Needle I may with the greater Certainty place its convex Surface under the Capſula of the Chryſtalline. I endeavour to place the convex Surface of my Needle about a Line below the inferior Surface of this Capſula, and about the ſame diſtance below the inferior Inſertions of the *Ligamentum Ciliare*, that I may afterwards with the greater Facility properly place its convex Surface under the inferior Surface of the Capſula of the Chryſtalline.—My Needle thus plac'd, I raiſe its convex Surface till it meets with a ſufficient Reſiſtance from the Chryſtalline to move it from its Seat, that by examining its Motion thro' the Pupil, I may not only be aſſur'd that my Needle is plac'd immediately under the Chryſtalline, but learn with great Exactneſs under what Part of the Capſula my Needle is thus plac'd. I endeavour by the ſucceeding Motions of my Needle, to place its convex Surface immediately under a certain Part of the Capſula of the Chryſtalline, that I may be the more exact in the Place proper to make the Opening into this Capſula. — The convex Part of my Needle being properly placed under the Capſula of the Chryſtalline, I raiſe the Chryſtalline about a third of a Line towards the ſuperior Part of the Orbit, and inſtantly withdraw my Needle about two Lines with its Surface in the ſame Direction, that by thus permitting the Chryſtalline to fall a certain diſtance below the Point of my Needle, I may with greater Certainty make an Opening of a proper Length in the inferior Part of its Capſula. — After having open'd the Capſula, I continue my Needle about two Lines towards the inferior Part of the Orbit, that by thus forcibly breaking into thoſe Parts of the *Vitreous* over which my Needle was plac'd, there may be a Place prepar'd for the more eaſy Reception of the diſeas'd Chryſtalline. I endeavour by the ſucceeding Motions ſo to place the plane Surface of my Needle on the ſuperior and lateral Surface of the Capſula of the Chryſtalline, that on directing my Needle towards the inferior Part of the Orbit, the anterior Surface of the Capſula of the diſeas'd Chryſtalline may maintain the ſame Diſtance and Direction from all the inner Surface of the *Uvea.* I endeavour by the ſucceeding Motions of my Needle to replace its plane Surface about a Line farther, towards the poſterior Part of the Capſula of the Chryſtalline, or about a Line farther from the ſuperior Inſertions of the *Ligamentum Ciliare*, that I may not be expos'd in paſſing the Chryſtalline thro' the Opening I made in its Capſula, to break any of thoſe Parts of the Capſula on which my Needle is plac'd, or ſeparate this Capſula from any of its Adheſions with the *Ligamentum Ciliare*; which might have happen'd, had I endeavour'd to force the Chryſtalline thro' the Opening in its Capſula, when the plain Surface of my Needle was in its preceding Situation: And to the more effectually anſwering this Intention, I continue my Needle in this oblique Direction of its plane Surface on the ſuperior and poſterior Part of the Capſula of the Chryſtalline, till I perceive it on its Paſſage on the Capſula about the Center of the Axis of the Eye, and then I raiſe the anterior Edge of my Needle towards the ſuperior Part of the Orbit; and in this Direction paſs it behind the inferior Surface of the *Uvea.*

The alter'd Chryſtalline being thus paſs'd thro' the Opening in its Capſula, with the plane Surface of my Needle parallel to the inner Surface of the *Uvea*; I turn this plane Surface of my Needle with great Quickneſs towards the inferior Part of the Globe, and endeavour by all the ſucceeding Motions ſo to place the Chryſtalline, as it may maintain its Seat out of the Axis of the Eye. I continue the plane Surface of my Needle for ſome little time plac'd on the preſent anterior Surface of the alter'd Chryſtalline, to give time for the Parts of the new convex *Vitreous* to poſſeſs their new Seat with the greater Exactneſs, and thus render the alter'd Chryſtalline leſs liable to change from the Situation in which I have plac'd it. I then raiſe the anterior Edge of my Needle, till its convex Surface is immediately directed towards the ſuperior Part of the Orbit, and draw my Needle out of the Eye in the ſame Direction, that I may not be expos'd to change any of the preſent Situation of the Contents of the Globe in its Paſſage.

CHAP. XIII.

Of the Manner of making my new Operation, neceſſary to the Removal of the ſeveral Species of that Cataract which ariſes from a Blow receiv'd near the Eye; where the alter'd Chryſtalline is paſs'd thro' the anterior Part of its Capſula, and being continually changing its Situation behind the Uvea, *is known by the* ſhaking Cataract.

I Proceed exactly as in the Operation for the ſeveral Species of the true Cataract, till my Needle is paſs'd about two Lines into the *Vitreous*; I then withdraw my Needle in the ſame Direction, till I judge its Point about one Line from its Entrance into the Globe; I then gently raiſe the poſterior Edge of my Needle, and very ſlowly direct my Hand backwards, till I judge that its convex Surface is brought parallel to the inner Surface of the *Uvea*; I then continue my Needle forward with its Surfaces in the ſame Direction, till I judge its Point to be enter'd within the Axis of the Eye. I then continue to direct my Hand backwards, till I judge that the convex Surface of my Needle is obliquely ſituated from its Point to the inner and outward Surface of the *Uvea*. I then continue my Needle forward with its Surfaces in the ſame Direction, till I perceive its Point immediately before the preſent anterior Surface of the diſeas'd Chryſtalline; I inſtantly direct the ſuperior Edge of my Needle towards the ſuperior Part of the Globe, till its plain Surface is plac'd on or near the ſuperior and lateral Surface of the alter'd Chryſtalline; I gently depreſs the Chryſtalline about a third or fourth Part of a Line, to learn with ſome Exactneſs on what Part of the Chryſtalline my Needle is plac'd; and if on inſpecting the Pupil, I perceive that the anterior Surface of the Chryſtalline is not continu'd in a direct Line at the ſame diſtance from the inner Surface of the *Uvea*, but approaches nearer to, or recedes farther from it, I then replace the plane Surface of my Needle nearer to, or farther from the Surface of the *Uvea*, according to the Direction I receiv'd from the Motion of the alter'd Chryſtalline; and when I find by the Motion of the alter'd Chryſtalline,

that

that the plane Surface of my Needle is ſo exactly plac'd on the Chryſtalline, that on preſſing it towards the inferior Part of the Orbit, the antetior Surface of the diſeas'd Chryſtalline would be continu'd in a direct Line, at the ſame diſtance from all the inner Surface of the *Uvea*. I continue my Needle with its Surfaces in the ſame Direction thro' the Axis of the Eye, and thus forcibly remove the alter'd Chryſtalline into thoſe Parts of the *Vitreous*, over which it was immediately plac'd. My Needle thus plac'd on the preſent ſuperior Surface of the alter'd Chryſtalline, I inſtantly direct its anterior Edge towards the inferior Part of the inner Surface of the *Uvea*, and finiſh the Operation as in that for the Removal of the ſeveral Species of the true Cataract.

CHAP. XIV.

Of the Reaſons of making my new Operation neceſſary to the Removal of the ſeveral Species of the Cataract known by the Name of the ſhaking Cataract, *as directed in the preceding Chapter.*

MY Needle having paſs'd about two Lines into the *Vitreous*, I withdraw it in the ſame Direction, till I judge its Point about one Line from its Entrance into the Globe, for the Service intended by the ſucceeding Motions. I gently raiſe the poſterior Edge of my Needle, and very ſlowly direct my Hand backward, till I judge that its convex Part is brought parallel to the inner Surface of the *Uvea*, that on directing its Point into the Axis of the Eye, I may not be expos'd to wound any of the Parts of the *Ligamentum Ciliare.* I endeavour by the ſucceeding Motions of my Needle ſo to place its plane Surface on the ſuperior and lateral Surface of the alter'd Chryſtalline, that on directing my Needle towards the inferior Part of the Orbit, the anterior Surface of the alter'd Chryſtalline may continue at the ſame Diſtance and Direction from the inner Surface of the *Uvea.* My Needle thus placed, I forcibly remove the alter'd Chryſtalline, and finiſh the Operation as in the true Cataract, for the Reaſons given in that Chapter.

CHAP. XV.

Of the Manner of making my new Operation neceſſary to the Removal of the ſeveral Species of the falſe Cataract.

I Proceed exactly as in the Operation for the ſeveral Species of the true Cataract, till I find by the Motion of the alter'd Chryſtalline that the plane Surface of my Needle is ſo exactly plac'd on the ſuperior and lateral Surface of the Capſula of the alter'd Chryſtalline, that on continuing it towards the inferior Part of the Orbit, the anterior Surface of the Capſula of the alter'd Chryſtalline might be placed in a direct Line at the ſame diſtance from the inner Surface of the *Uvea*. I again depreſs the alter'd Chryſtalline about half a Line towards the inferior Part of the Globe; and by this Motion of my Needle I enlarge the Opening I made in the inferior Part of its Capſula, and leſſen the Plenitude of its Contents. I then once more raiſe my Needle towards the ſuperior Part of the Globe, with its Surfaces in the ſame Direction, and its anterior Edge at the ſame diſtance from the ſuperior and inner Surface of the *Uvea*, as it was immediately preceding its being firſt plac'd on the ſuperior Part of the Capſula of the Chryſtalline. I then replace the plane Surface of my Needle about a Line farther, towards the poſterior Part of the Capſula of the Chryſtalline, or about a Line farther from the ſuperior Inſertions of the *Ligamentum Ciliare*. My Needle thus plac'd, I continue it very ſlowly, directing its plane Surface immediately towards the Opening I made in this Capſula, and thus forcibly remove the alter'd Chryſtalline into thoſe Parts of the *Vitreous* thro' which I paſs'd my Needle, after having broke thro' the inferior Parts of the Chryſtalline and its Capſula.

And as the Contents of the Chryſtalline are thus paſs'd thro' the Opening in this Capſula, I continue the plane Surface of my Needle on the ſuperior and lateral Surface of the Capſula of the Chryſtalline, till I judge it in its Paſſage on the Capſula about the Center of the Axis of the Eye, when inſtantly I raiſe the anterior Edge of my Needle towards the ſuperior Part of the Orbit; and in this Direction paſs it with great Exactneſs behind the inferior Surface of the *Uvea*. My Needle thus plac'd, I turn with great Quickneſs its plane Surface towards the inferior Part of the Orbit; thus it neceſſarily falls on ſome

of

of the Parts of the alter'd Chryſtalline. I then direct the plane Surface of my Needle obliquely towards the poſterior Part of the Globe, and forcibly continue it about a Line below a Line drawn parallel to the Center of the Globe, and thus mix the Contents of the alter'd Chryſtalline with ſome of the inferior Parts of the Vitreous.

By thus paſſing the diſeas'd Chryſtalline thro' the Opening I made in its Capſula, the ſuperior Part of this Capſula being ſuſpended by its Adheſions to the *Ligamentum Ciliare*, the alter'd Chryſtalline paſſes with great Facility from under its Capſula, not only from the Aſſiſtance it receives by the Needle, but from that of the Vitreous, which at this time neceſſarily comes forward with ſome degree of Force, to make room for the Reception of the alter'd Chryſtalline.

And from this ſlow and regular Paſſage of the alter'd Chryſtalline out of the Axis of the Eye, the concave Vitreous muſt neceſſarily change its Situation, and riſe with great Exactneſs immediately behind the ſuperior and poſterior Surface of this Capſula, and become convex; and as the ſuperior and poſterior Part of this Capſula is thus forced on the inner Surface of the anterior, the whole Capſula of the alter'd Chryſtalline is immediately ſeated before the Membrane of the now convex Vitreous; and it is thus the Figure of the convex Vitreous is nearly, if not exactly, the ſame with that of the healthful Chryſtalline.

After having thus remov'd from the Axis of the Eye the Contents of the alter'd Chryſtalline, I proceed to remove this opake Capſula from before the Membrane of the now convex Vitreous; and for this End I withdraw my Needle, till I judge its Point about one Line from its Entrance into the Globe; and after having gently rais'd the poſterior Edge of my Needle, I very ſlowly direct my Hand backwards, till I judge that its convex Surface is brought parallel to the inner Surface of the *Uvea*. I then continue my Needle forward with its Surface in the ſame Direction, till I judge its Point to be enter'd within the Axis of the Eye. I then continue to direct my Hand backwards, till I judge that the convex Surface of my Needle is obliquely ſituated from its Point to the inner and outward Surface of the *Uvea*. I then continue my Needle forward with its Surface in the ſame Direction, till I perceive its Point enter'd into the poſterior Chamber of the Aqueous, immediately before the anterior Surface of the opake Capſula. I then leſſen the Preſſure of my *Speculum*, and continue my Needle thro' the poſterior Chamber of the Aqueous, with its Surfaces in the ſame Direction, till its Point is carried about half a Line under the inferior and lateral Edge of the Pupil, when the Pupil is neither contracted nor dilated more than in its healthful Diameter in the ordinary Degrees of Light. I then gently preſs on that Part of the Capſula over which the inferior Edge of my Needle is plac'd, and thus ſeparate with great Exactneſs all the inferior and lateral Extremities of the *Ligamentum Ciliare* towards the greater *Canthus*, from their Adheſion to this opake Capſula. I then continue the plane Surface of my Needle towards the Center of the opake Capſula, and direct its Point forward till arriv'd about the ſame diſtance under the ſuperior and lateral Edge of the Pupil, as it was in the preceding Motion of my Needle under the inferior; and by gently preſſing with the ſuperior Edge of my Needle, I ſeparate in like manner all the ſuperior and lateral Extremities of the *Ligamentum Ciliare* towards the greater *Canthus*, from their Adheſion to this opake Capſula. I then withdraw my Needle till its Point is brought from behind the Pupil, and continue to raiſe the ſuperior Edge of it towards the ſuperior Part of the Orbit, and thus paſs its plane Surface immediately before the anterior Part of this opake Capſula, till its Point is arriv'd about the ſame diſtance under the Center of the ſuperior Edge of the Pupil, as it was in the preceding Motion under the ſuperior and lateral; and by gently preſſing with the ſuperior Edge of my Needle, I in like manner ſeparate with great Exactneſs all the ſuperior and lateral Extremities towards the leſſer *Canthus* from their Adheſions to this opake Capſula.

The Opake Capſula of the Chryſtalline being thus ſeparated on all Sides from its Adheſions to the *Ligamentum Ciliare*; and the plane Surface of my Needle, now placed on the ſuperior and lateral Part of the anterior Surface of this opake Capſula, I very gently preſs with the ſuperior Edge of my Needle on this Capſula; and by continuing its Surfaces in the ſame Direction towards the inferior and inner Surface of the *Uvea*, the opake Capſula paſſes with great Exactneſs from before the Surface of the now Convex Vitreous. — My Needle with the opake Capſula of the Chryſtalline being now out of the Axis of the Eye, and ſeated immediately behind the inferior and inner Surface of the *Uvea*, I continue it, with its Surfaces in the ſame Direction, to about a Line below a Line drawn parallel to the Center of the Globe, and thus place this opake Capſula near the inferior and lower Part of the Vitreous; I then inſtantly raiſe the anterior Edge of my Needle, 'till its Convex Surface is immediately directed towards the ſuperior Part of the Orbit, and very ſlowly take it out of the Eye, in the ſame Direction.

CHAP. XVI.

Of the Reaſons of making my new Operation neceſſary to the Removal of the ſeveral Species of the falſe Cataract, as directed in the preceding Chapter.

I Proceed exactly, as in the Operation for the ſeveral Species of the true Cataract, 'till the plane Surface of my Needle is properly placed on the ſuperior and lateral Surface of the Capſula of the alter'd Chryſtalline; that by the ſucceeding Motions of my Needle in puſhing the Chryſtalline towards the inferior Part of the Globe, the anterior Surface of its Capſula may maintain the ſame Diſtance and Direction from the inner Surface of the *Uvea.* I then endeavour to replace the plane Surface of my Needle, about a Line farther towards the poſterior Part of the Capſula of the alter'd Chryſtalline, or about a Line farther from the ſuperior Inſertions of the *Ligamentum Ciliare,* that I may no tbe expoſed on preſſing the alter'd Chryſtalline, through the Opening I made in its Capſula, to break any of thoſe Parts of the Capſula, on which my Needle is placed, or ſeparate this Capſula from any of its Adheſions with the *Ligamentum Ciliare*; which might have happen'd, had I endeavour'd to force the alter'd Chryſtalline through the Opening in its Capſula, when the plane Surface of my Needle was in its preceding Situation. — The alter'd Chryſtalline being paſs'd through the Opening I made in its Capſula, I endeavour, by all the ſucceeding Motions of my Needle, to mix its Contents with thoſe of that Part of the Vitreous, which is ſeated out of the Axis of the Eye; that notwithſtanding its Fluidity, no Part of it ſhall be able to enter the poſterior Chamber of the Aqueous, during the Progreſs of the Operation, neceſſary to the Removal of the Capſula from before the Surface of the now Convex Vitreous.

Having thus placed the Contents of the Chryſtalline, I withdraw my Needle, with its Surfaces in the ſame Direction, 'till I judge its Point about one Line from its Entrance with the Globe, for the Service intended by the ſucceeding Motion. I gently raiſe the poſterior Edge of my Needle, and very ſlowly direct my Hand backward, 'till I judge that its Convex Surface is brought parallel to the inner Surface of the *Uvea*; that on directing its Point into the Axis of the Eye, I may not be expoſed to wound any of the Parts of the *Ligamentum Ciliare.* My Needle being enter'd into the poſterior Chamber of the Aqueous, I leſſen the Preſſure of my Speculum, that by the preſent Loſs of the Plenitude of the Globe, from having open'd the aqueous Chambers, I may ſo conſiderably enlarge its Diameter, and leſſen its Convexity, as to be able to paſs with the greateſt Facility the plane Surface of my Needle immediately before all the Surface of the opake Capſula, without being expos'd to alter in its Paſſage the preſent Poſition of any of the Parts of the Capſula or Vitreous. — I intend, by all the ſucceeding Motions of my Needle, to remove with great Exactneſs the opake Capſula, without wounding, or violently breaking any of the Parts of the *Ligamentum Ciliare*, and effectually place it out of the Axis of the Eye.

CHAP. XVII.

Of the Manner of making my new Operation neceſſary to the Removal of the ſeveral Species of that State of the Glaucoma, *where the* Iris *and immediate Organ of Sight maintain their healthful Perfection.*

I Proceed exactly, as in the Operation for that Alteration of the Chryſtalline, call'd the *Shaking Cataract*, 'till I perceive the Point of my Needle within the poſterior Chamber of the Aqueous. I then ſeparate the Capſula of the Chryſtalline from its Adheſions to the *Ligamentum Ciliare*, exactly after the ſame Manner as I have directed in that Part of the Operation for the ſeveral Species of the falſe Cataract, where I remove the opake Capſula from before the Convex Vitreous. — The Capſula of the Chryſtalline being now ſeparated on all Sides from its Adheſions to the *Liga-*

Ligamentum Ciliare, and the plane Surface of my Needle now placed on the ſuperior and lateral Part of the anterior Surface of this Capſula, I gently depreſs the Chryſtalline about a third or fourth Part of a Line, to learn with ſome Exactneſs, on what Part of the Capſula of the Chryſtalline my Needle is placed: And if on inſpecting the Pupil, I perceive that the anterior Surface of the Capſula of the Chryſtalline is not continued in a direct Line, at the ſame Diſtance from the inner Surface of the *Uvea*, but approaches nearer to, or recedes farther from it; I then replace the plane Surface of my Needle nearer or farther from the inner Surface of the *Uvea*, according to the Direction I received from the Motion of by the alter'd Chryſtalline; and when I find by the Motion of the alter'd Chryſtalline, that the plane Surface of my Needle is ſo exactly placed, that on continuing it towards the inferior Part of the Orbit, the anterior Surface of the Capſula of the alter'd Chryſtalline would be continued in a direct Line, at the ſame Diſtance from the inner Surface of the *Uvea*; I continue to move my Needle very ſlowly through the Axis of the Eye,'till its Convex Surface is placed immediately behind the inferior and inner Surface of the *Uvea*, and thus forcibly remove the Chryſtalline with the Capſula, into the Vitreous.

By this ſlow and regular Manner of removing the Chryſtalline with its Capſula out of the Axis of the Eye, the Concave Vitreous muſt neceſſarily come forward, to give Place for the Reception of the alter'd Chryſtalline, and become Convex.

My Needle thus placed with its plane Surface on the preſent ſuperior Surface of the Capſula of the alter'd Chryſtalline, I inſtantly direct its anterior Edge towards the inferior Part of the inner Surface of the *Uvea*; and by thus changing the Direction of my Needle, its plane Surface is brought about the ſame Diſtance towards the preſent anterior Surface of the Capſula of the alter'd Chryſtalline.

The plane Surface of my Needle being now obliquely ſituated towards the poſterior Part of the Globe, I continue my Needle in the ſame Direction, about a Line below a Line drawn parallel to its Center, and thus place the Chryſtalline near the inferior and lower Parts of the Vitreous. — I then continue my Needle about two Minutes thus plac'd on the preſent anterior Surface of the diſeaſed Chryſtalline: And after raiſing its poſterior Edge till its convex Surface is immediately directed towards the ſuperior Part of the Orbit, I very ſlowly take it out of the Eye in the ſame Direction.

CHAP. XVIII.

Of the Reaſons of making my new Operation neceſſary to the Removal of the ſeveral Species of that State of the Glaucoma, *where the* Iris *and immediate Organ of Sight maintain their healthful Perfection.*

I Proceed exactly as in the Operation for that Alteration of the Chryſtalline, call'd the *Shaking Cataract*, 'till I perceive the Point of my Needle within the poſterior Chamber of the aqueous Humour; that I may with the greater Certainty enter this Chamber, without being expos'd to wound any of the Parts of the *Ligamentum Ciliare.* I intend by the ſucceeding Motions of my Needle to ſeparate with great Exactneſs the *Ligamentum Ciliare* from all its Adheſions to the Capſula of the Chryſtalline, without wounding or violently breaking any of its Parts. I endeavour by the ſucceeding Motions of my Needle ſo to place its plane Surface on the ſuperior and lateral Surface of the Capſula of the Chryſtalline, that on directing my Needle towards the inferior Part of the Orbit, the anterior Surface of the Capſula of the alter'd Chryſtalline may continue at the ſame Diſtance and Direction from all the inner Surface of the *Uvea*.

The Chryſtalline with its Capſula being plac'd out of the Axis of the Eye; with the plane Surface of my Needle on the preſent ſuperior Surface of the Capſula of the alter'd Chryſtalline, I endeavour by all the ſucceeding Motions ſo to place the alter'd Chryſtalline, as it may maintain its Seat out of the Axis of the Eye.

CHAP. XIX.

Of the Regimen neceſſary to ſucceed my new Operations for the ſeveral Species of the true Cataract, and the ſeveral Species of the Cataract call'd the ſhaking Cataract. *For the ſeveral Species of the falſe Cataract, and the ſeveral Species of that State of the* Glaucoma, *where the* Iris *and immediate Organ of Sight maintain their healthful Perfection.*

AFTER the Operation I cauſe ſome Drops of a Mixture (made of a Tincture of *Balſ. Peruv.* with warm Water) to be dropt into the Eye for ſome Minutes; and immediately after I cauſe to be apply'd over the Eyelids a warm Cataplaſm, made with ſome Drops of the above-mention'd Mixture, and the Pulp of *Caſſia.* Theſe Drops and Cataplaſm are to be repeated every four Hours (except at the time of Sleep) till the ſecond

Morning after the Operation, when I cauſe the Eye to be fomented for about half an Hour, in the uſual manner, with a ſpirituous Fomentation with Camphire. I then give free Power to the Motion of the Eyelids, and cauſe a Shade to be ſo fix'd before the Eye, as to admit of its receiving very little Light, and entirely to prevent the Light from falling immediately within the Axis of the Eye. I cauſe this Fomentation to be repeated twice a Day for about fifteen Days, and the Shade to be continu'd in different Directions before the Axis of the Eye, till the Eye can perceive Objects in the ordinary Degrees of Light without Pain.

The Patient is to be continu'd for about twenty Days in the medicinal attenuating Diet, accompany'd with gentle Evacuations, as mention'd neceſſary to precede theſe Operations.

FINIS.

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TREATISE
OF THE
GOUT.

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9

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BY

A LICENTIATE PRACTITIONER in PHYSICK.

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9

A
TREATISE
OF THE
GOUT.

THE Author of the following Sheets having, in an early State of Life, been led into the Study and Practice of Phyſick, being, as he then thought himſelf, ſufficiently acquainted with the Anatomy of Human Bodies, and the Theory of moſt Diſtempers: But this did not ſatisfy, till he was likewiſe acquainted with Medicines, which the Vegetable, Mineral, and

Animal World afforded, their Virtues, and Manner of Acting in Human Bodies; their various Effects were in a Courſe of Practice obvious, but the Cauſes which produced thoſe Effects, he thought himſelf obliged to ſearch out. Having examined Authors both Ancient and Modern, at laſt he came to this Concluſion: That the Depravity of the Blood muſt be the immediate Cauſe of Diſtempers; and upon this Baſis he laid the Foundation of Practice, in which he was more or leſs Succeſsful, as the Great Director of Human Affairs thought fit.

As he concluded with himſelf, That the Depravity of the Blood was the procuring Cauſe of all Diſtempers, much more ſo of the *Gout*; ſo that he has contrived a Sett of Medicines adapted to grapple with and diſperſe thoſe corroſive Salts collected in the Blood, and ſent to the Joints. The firſt Obſervation occurring, confirm'd him in his Notions, that Flannels and Patience are not the only Remedies to be made uſe of. The latter he has known miſerably worn out, which appeared by the many horrid Execrations, and dreadful Oaths, enough to ſtrike a trembling on the By-ſtanders; by which it appeared their Lives were a burden to themſelves, and neareſt Relations.

MANY Difficulties muſt attend an Undertaking of this Nature; but a Mind endowed with any Degree of Generoſity, and Love to his Fellow-Creature, muſt over-look all the little Cavils, Ridicule, and Aſperſions the Author muſt bring upon himſelf. He knows he ſhall be look'd on in the World, as one who publiſhes a Method to find out the *Philoſopher's Stone.* However, he has this to comfort him, that his Name is concealed; and that the Obſervations are true in Fact, and ſome to be found ready to aſſert the Truth of their being relieved of this cruel Diſtemper, by his Method; which is more peculiarly adapted to it, than has been practiſed by others before him.

Of the GOUT.

MY Purpoſe is not to examine the Opinions of thoſe who have wrote of this Diſtemper; all agree it to be a corroſive Humour, ſeparated from the Blood, and thrown upon the Joints, from whence it derives its Name, the *Arthritis*; from the Attacks it makes on the *Feet*, the *Podagra*. But in my way of Thinking, it muſt be a *Lixivium* got into the Maſs, collected, and become highly corroſive, and thereby Heterogeneous, is ſent off to the Joint of the great Toe, found to be the proper Receptacle, where it is lodged. Thoſe corroſive Salts diſperſing themſelves upon the *Perioſtium*, the Tendons and Ligaments, cauſe thoſe tormenting Pains the afflicted Patient endures in every Paroxyſm, till a Quantity of freſh Juices is ſent to the Parts, which dilute and diſſolve the Salts, cauſing the Parts to tumify; then the Pain gradually abates. The Humour thus attenuated, great part of it perſpires, the reſt by degrees is abſorbed by the Capillary Veins, and returns again into the Blood; where if it meet with any more of thoſe Salts, the

Humour makes another Attack either on the ſame Part of the other Foot, or the Ancle, or Knee of the ſame. This proves a long, tedious Fit: then what does not perſpire, returns and gathers more Strength, increaſing in Quantity, becoming more and more corroſive in Quality, till the Texture of the Blood is broken, little or no Nouriſhment afforded to the Parts, the Muſcles of the Legs dwindling away, and the two *Focils* only cover'd with Skin. To add to the Miſery of the Afflicted, a petrifying Diſpoſition prevails upon the Juices; Stones are bred in the *Pelvis* of the Kidneys, as I obſerved in a Body I once open'd: In his left Kidney I found a large Stone of the bigneſs of an Egg, the Subſtance of the Kidney in a manner gone, cover'd only with a Membrane;

brane; the *Ureter* as large as a Sheep's Gut. This Gentleman for many Years had been afflicted with the Gout, Dropſy, and Stone; no doubt but the firſt was the procuring Cauſe of the other two.

BUT why the Joints are more expoſed to the Attacks of this Diſtemper than other Parts of the Body, will appear if we obſerve, that each Part attracts to itſelf certain Juices proper for its particular Nouriſhment or Uſe, each Gland a Juice proper for Secretion. So the ſolid Parts, called by Anatomiſts, *Spermatick*, do likewiſe receive from the Blood certain Juices adapted either for Nouriſhment, or to aſſiſt Motion. Now thoſe Salts at firſt being few in compariſon of what they become afterwards, do mix with the nutritive Juice of the Solids, and by them are carried to the Joints, till the whole Maſs is thoroughly impregnated with thoſe vicious Salts; then the remote Parts lie equally expoſed, the Center as yet being pretty well defended by the animal and vital Spirits.

I am not at any loſs to account why miſerable Sufferers are ſo eaſy under their Torment, when it is duly conſider'd how dangerous it is, to repel that collected Humour ſo highly impregnated with thoſe corroſive Salts, immediately into the Blood, where it is very probable a larger Quantity of the ſame Humour may circulate with the Juices; both meeting together, not being Homogene, nor fit to aſſimilate, muſt be lodged ſomewhere: The Stomach is attacked, and the Patient is taken with the *Cholera Morbus*, accompanied with grievous tormenting Gripes; if it fall on the thin Guts, the *Iliac* Paſſion; if the thick, the *Dyſentery*, or *Diarrhœa.* If the *Meninges* be viſited, a *Coma* or an Apoplexy may be apprehended. All theſe Symptoms may be eaſily prevented, if a prudent Regimen be obſerved. I cannot but take notice of a miſtaken Notion that prevails much; That becauſe the Gout attracts to itſelf the *Semina* of ſome other Diſtempers, therefore it muſt be wholeſome, and the regular Approaches by no means to be diſturbed. I have known it affirmed, the acuter the Pains, the better for the Patient: not conſidering, the more corroſive the Humour is, the more the Texture of the Blood muſt be broken, conſequently the noble Parts more expoſed to the Virulency of the Diſtemper.

THE Cauſe of this Diſtemper is either hereditary, or acquired. If it deſcend from gouty Parents, it is difficult to prevent its Attacks upon any Irregularity in Drink; the Blood being tinged with it *ab initio*, it eaſier arrives to a Height in ſuch than in others.

I know a Family, whoſe Father had been very much afflicted with the Gout; he left four Sons, the Eldeſt and two Youngeſt were much afflicted with the Diſtemper, but the Second never had any Symptom of it. The Reaſon muſt be, this Gentleman lived ſparingly, drank moderately,

rately, took care to avoid all Exceſs; the other three drank hard, and were likewiſe not over-regular in their Eating. This I mention, to ſhew, that Perſons tho' naturally diſpoſed to the Gout, yet may be kept from it by Care. Undoubtedly when Men drink auſtere Wines, and indulge their Palates with large Meals of various Diſhes, with ſtrong Gravies, and ſour Sauces; this muſt furniſh their Blood with Matter enough to bring on this Diſtemper.

BUT that the Nature of this Diſtemper may be ſet in a clearer Light, and farther Reaſons offer'd why its Cure may with Safety and Succeſs be undertaken; all Surgeons very well know, that a ſmall Quantity of any Cauſtick, whether *Lapis infernalis*, or the Lunar Cauſtick, if ten

Grains of either be apply'd to a Part, in a few Minutes they form an Eſcar: Why is it? but that the corroſive Salts abſtracted from their Humidity, and contracted into a ſolid Body, their Power thus united, exert their burning Quality on the Part. Diſſolve that Quantity in half an Ounce of Water, and waſh a Sore, the ſmarting Pain will be very great and intolerable; much more ſo, if it touch a nervous Part, or any Tendon: but upon a ſound Part, where the *Cuticula* is not fretted off, will ſcarce have any Effect. Take that Quantity of the ſame Cauſtick, diſſolve it in a very large Quantity of Water, there hardly any Taſte or Sharpneſs can be perceived, but muſt entirely be loſt.

From whence we may infer, that the Gouty Salts being collected into a Body, the Juices wherein they are contain'd, are thereby render'd incapable of aſſimilating with the Blood, or for the Nouriſhment of any Part, but being highly offenſive to the animal as well as the vital Spirits, are thereby thrown off to the Joints. All agree that every Paroxyſm of the Gout is a critical Diſcharge, the Blood freeing itſelf from ſo great an Enemy.

It remains that we account for the Chalk form'd on the Joints, which muſt be produced from one of theſe two Cauſes: As I obſerved before, the Juices adapted for the Nouriſhment of the ſolid Parts are thoſe that the Gouty Salts do mix with; being unfit for that Service, their Texture vitiated and changed, and become a groſs milky Juice, extravaſated and fixed upon a Joint, the Serum which the Capillary Veins can abſorb returns into the Maſs; what cannot, is exhaled; then a dry white Subſtance, reſembling Chalk, is form'd: Or the *Perioſtium*, by many Attacks from the Gout, being fretted off, the very Subſtance of the Bone is made the Object for thoſe Salts to exert their power; where acting with vigour and violence, corroding the Parts, that Liquor, as I ſaid before, being extravaſated, fixes itſelf upon the Tendons, nay even the Extremities of the Bones. Not many Years ago, I ſaw the Muſcles both of the Thighs and Legs ſtuff'd full of chalky Stones, harder than common Chalk: I took ſome of them out; I obſerv'd the Ulcer whence they were taken healed immediately, which was occaſion'd by the Alkali the Chalk afforded to the Part; that milky Juices muſt circulate with the Blood is evident, elſe they could never be fixed upon the Muſcles. From the whole we muſt infer, that if thoſe Salts are diſunited and diſperſed in the minuteſt Particles thro' the Maſs, there can no Paroxyſm happen till they are re-united, and their Quantity increaſed by Irregularity in Living, as before obſerved: but if due care be taken Spring and Fall, to ſend into the Blood Specificks well appointed to promote the Diſunion of thoſe Salts, and diſperſe them through the whole

Fluids, or rather the excrementitious Juices, and a regular Circulation promoted by ſuitable Exerciſe; there is no Reaſon why the Gout may not be prevented in its Attacks for Years, tho' the Seeds of it may remain in a ſmall Quantity. Now it is to be hoped this ſmall *Treatiſe* may help take off the Prejudice Mankind is carried away with, that the Gout is not to be cured but at the expence of the Patient's Life, no doubt but many have died by *mala Praxis* in this as well as other Diſtempers; yet no Reaſon can be offer'd why a regular rational Method ſhould not be taken in this as well as in other Caſes.

ABOVE twenty Years ago, being then a Practitioner in Surgery, I was called to a Boy of eight or nine Years old: I found an Inflammation from the Knee to the Inſtep, fully ſuppurated; which I immediately laid open, and diſcharged above a Pint and half of well-digeſted Matter. I found by my Probe the *Tibia* lay bare, diveſted of the *Perioſtium*, and being expoſed to the Air, began to turn black. In ſome time I procured an Exfoliation, and took out a Splinter reaching from the Knee to the Ancle. After the Separation was made, the Ulcer began to incarn and heal, but the upper part of the *Tibia* under the *Patella* being carious, lying under the Joint, a Lee was diſcharged of a browniſh Colour, and caſt forth ſome ſmall pieces of Bones. After it heal'd, I obſerved the Boy had Swellings under his Jaws, the Glands gathering, and in the *Inguina*. All the Symptoms of the

King's Evil appearing, I concluded it to be only accidental, and to proceed from the Lee of the carious Bones mixing with the Blood, and lodged in the Glands, which I removed with altering Diet-Drinks, and abſorbing Powders, and frequent Purging. Some Years after, I ſaw him a luſty, ſtrong, young Fellow, and a Sailor. This Obſervation, tho' ſomewhat foreign from the Subject in hand, yet ſerves to demonſtrate, that a Lee extravaſated may be abſorbed by the *Capillary* Veſſels, and circulate with the Blood: If in one Caſe, why not in another of the like Nature?

AFTER this ſhort Account of the Gout, we ſhall proceed to the Cure. And to relieve the Patient in the Paroxyſm, and in as ſhort time as poſſible,

ſible, 'tis neceſſary his Lodging be in a clear Air, his Bed-Chamber large, in cold Weather with a good Fire, his Bed not too near it; the reaſon is, the rarified Effluvia diſcharged by the Breath, and by Tranſpiration, ought to have large room to diſperſe themſelves; for if by inſpiration thoſe Vapours are re-united with the Blood, it muſt be of ill conſequence to the Patient, and very much retard the Cure. As to the Patient's Diet in the Paroxyſm, it muſt be moderate, tho' not too ſparing, of ſuch Food as digeſts eaſily, avoiding auſtere Sauces; rather of one Diſh than many. Due regard muſt be paid to his ordinary Courſe of Life, more eſpecially as to his Drink; if he accuſtom'd himſelf to drink plentifully in his Health, he muſt be allow'd the ſame in his Illneſs, abating ſomewhat in the

Quantity, for the Blood muſt by no means be impoveriſhed. I have known half a Pint of Wine too much for ſome, when a Bottle has been too little for others. The Wines to be avoided are *Rheniſh*, *Champaign*, *Burgundy*, *French* White, *Madera*; thoſe Wines are not to be touch'd, neither in nor out of the Fit. The ſafeſt to be drank, are mellow and light Red *Port*, White *Mountain*, *Sherry*, or *Canary*.

Now as to the Medicines uſed in this Diſtemper, they are ſuch as are capable to ſearch out the Enemy, diſunite its Parts, reduce the Salts into minute Particles, attenuating the Liquor that contains them; thereby diſperſing the minute Particles thro' the Maſs of Fluids: Then other Medicines muſt be plentifully taken, as

Purgatives, Diaphoreticks, but chiefly Diureticks. An able Phyſician may eaſily contrive a Sett of Medicines to anſwer all Intentions.

THE Author uſes an Amalgama, prepared from Metals and Minerals, ſo adapted, that the Doſe when ſent into the Stomach, ſits eaſy, unleſs (which is but ſeldom) it meet with any corroſive Juices, then a ſlight Ferment, with an Uneaſineſs which ſoon goes off; but if very troubleſome, a gentle Puke of Camomile or Carduus Tea quickly removes it. Then the Specifick gets an eaſy Paſſage into the Blood, and is carried to the Joint, where if given for ſome time, and in ſufficient Doſes, it never fails of anſwering all the forementioned Intentions. But there are ſeveral Medicines uſed, one adapted to prepare for the Uſe of the other, till the Blood is totally freed from all Remains of the Diſtemper. During the Patient's taking Medicines, diſcuſſing Cataplaſms may ſafely and with ſucceſs be uſed.

I ſhall give only four Inſtances of Perſons that have been relieved by this Method. The firſt was a Captain in a Foot Regiment, to whom I was called in 1695. He was above 60 Years of Age, had drank hard for many Years: I found him in dreadful Torment, with Pains in both Feet; I took from him immediately eight Ounces of Blood; for his Drink, order'd him Emulſions, with his Specificks in large Doſes, purged him three times a Week, allow'd him Wine ſufficient to ſupport his Spirits. By degrees his Stomach return'd; then I order'd him gentle *Diaphoreticks* mix'd with his Specificks. The days he neither purged nor ſweat, he took his Specificks, mix'd with *Diureticks*: in the mean time, I allow'd him plentiful Nouriſhment. In three Weeks, his Blood being thoroughly rectified, I order'd his Servants to get his Horſes ready: about ten a-Clock he rode out; I expected him back at his Lodging at four or five. I ſent about that time: at nine I ſent again, but he was not at home; next Morning about Eight, to my ſurprize, I met him in the Street, dancing and upbraiding me for confining him with my Drugs, for *Moore*'s Wine had wrought a perfect Cure. He continued free from any Symptoms of the Diſtemper while I knew him; for I heard he had ſold out, and went to *Jamaica*, and lived ſeveral Years after.

SOME time after I was called to a poor Salt Officer, who labour'd under the Anguiſh of the Gout above ſix Months in the Year; he had it in all Parts, the Joints of his Fingers full of Chalk; he begg'd of me to end his days, for his Life was a burden both to himſelf and his Family: for what by paying others for doing his Duty, and the Expence of attending him in his Gout, had reduced his Affairs to nothing. I immediately took ten Ounces of Blood: He took his Specificks in large Doſes, with Emulſions; every ſecond day he was briskly purged, his purging Phyſick was well impregnated with abſorbing Alkali's, the *Hauſtus* he took going to reſt was of the ſame nature, greatly *Narcotic* and *Alexipharmic*. Every fourth day he ſweat moderately; in a fortnight his Evacuations were more ſeldom; in the intermitting Days his Blood was well ſupply'd with Specificks mix'd with *Diureticks*. His Buſineſs requiring his Attendance, I order'd him a medicated Ale, then left him. I did not ſee him for eighteen Months; during this time, he had not the leaſt Appearance of any Viſit from the Gout.

THE next I was call'd to, was a Merchant of about 28 Years of Age, had drank plentifully, hunted much. I found him rack'd with a Pain in the Joint of his great Toe, ſo acute that he could not bear the Sheet to touch it. Immediately I took twelve Ounces of Blood, which gave him ſome eaſe; I plied him with his

Specificks in large Doſes; next Morning he could walk about his Room: then every other day I purged him ſmartly; the intermitting Days he took his Specificks, ſometimes in Powders, other times in Bolus's. I order'd him a Decoction wherein was boiled Vegetables and Minerals, which furniſh'd the Blood with a large Quantity of Specifick Juices, which, with the *Diaphoreticks*, brought him to the full uſe of his Feet: but he being obliged to undertake a Journey of forty Miles to ſee a rich Aunt lying on her Death-bed, with the view of getting 8 or 900 *l.* we were obliged to break off the Courſe before we had half finiſhed. About 12 Months after I was called to him again. That Paroxyſm was very ſharp. I uſed the ſame Method, but his Medicines were given in larger Doſes. In four Days his Pains went off, he could with little trouble walk about his Chamber; in 21 Days his Limbs recover'd their full Strength. He went to *Carolina*, I did not ſee him for ſeven Years, and that was by accident in a Coffee-Houſe by *Temple-Bar*, in perfect Health. He did aſſure me he had never any Symptom of the Gout, nor did he take any Medicine ſince he left me.

SOME time after I was called to a Maſter of a Ship, who made a dreadful Complaint of a Rheumatic Pain that had ſeized his Ancle, and the Inſtep of his Foot. The Part was much inflam'd, and the Veins turgid. Had I mention'd the Gout, I might not meddle; but I indulged the Notion of a Rheumatiſm, and thereby had full liberty to act. Immediately I made a Revulſion by Bleeding, and follow'd the ſame Method as I had with others, by which the Pains went off from his Foot; but being outward-bound, his Ship cleared out, he was obliged to go to Sea before his Cure was effected. When he made his Voyage, I preſſed on him the neceſſity of going thro' a Courſe to free his Blood of that Humour; but he declin'd it, and ſince I hear he has been much afflicted with the Gout.

I could give more Inſtances of People who have been reliev'd in the Gout; but theſe may be ſufficient to ſhew the World, that Flannels and Patience are not the only Remedies found to be Uſeful in this Diſtemper.

FINIS.